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IN THE

# Supreme Court of the United States

OCTOBER TERM 1971

No. 71-485

ROBERT GOTTSCHALK, Acting Commissioner of Patents, *Petitioner*,

v.

GARY R. BENSON and ARTHUR C. TABBOT, *Respondents*.

On Writ of Certiorari to the United States Court of Customs and Patent Appeals

## BRIEF AMICUS CURIAE ON BEHALF OF THE BUSINESS EQUIPMENT MANUFACTURERS ASSOCIATION

### I.

### INTEREST OF AMICUS CURIAE

This brief *amicus curiae* is submitted by the Business Equipment Manufacturers Association ("BEMA") in accordance with Rule 42(2) of this Court. Both the petitioner and the respondents have consented to the filing of this brief.[1]

BEMA is the trade association which has represented the business equipment industry for the past 56 years.

[1] The letters from counsel for the parties giving their consent to the filing of this brief are on file with the Clerk of this Court.

The sixty-five (65) companies comprising the current BEMA membership include the nation's leading manufacturers of computers and computer-related equipment. While product lines of member companies vary widely, the following list is illustrative: electronic computers, computer software, including programs, computer input and output devices, computer storage devices, support services, data transmission equipment, optical and magnetic character readers, addressing machines, adding, calculating, accounting and bookkeeping machines, office copying machines, typewriters, dictating equipment, and office furniture. The extent to which much of this equipment can be utilized effectively depends in great measure on the applications and systems programs developed by computer programmers to control the operations of this equipment.[1]

One of BEMA's three semi-autonomous product groups—the Data Processing Group ("DPG")—is especially concerned with the issues presented in this case.[2] The members of DPG have consistently been

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[1] BEMA is also the approved sponsor under the American National Standards Institute (formerly the United States of America Standards Institute and also formerly the American Standards Association) for the establishment of domestic and international standards related to information processing, computers and office machines.

[2] The following members of BEMA's Data Processing Group join in this brief: Addressograph Multigraph Corporation, Burroughs Corporation, Computer Machinery Corporation, Data Products Corporation, Digitronics Corporation, Honeywell, Inc., IBM Corporation, Moore Business Forms, Inc., Mosler, The National Cash Register Company, Olivetti Corporation of America, Pitney-Bowes, Inc., The Singer Company, The Standard Register Company, Sperry Rand Corporation, TRW Data Systems, Inc., Tally Corporation, UARCO, Inc., Wang Laboratories, Inc., Xerox Corporation.

fore-runners in achieving major developments, in both the concept and application, of data processing, and have contributed greatly to the present significant role of the computer in modern society. As a result of the need for continuing advancement in computer programming, these members maintain extensive programs devoted to applied research and systems development, as well as in all other phases of computer use and data and information processing.

Neither BEMA nor any of its member companies has any direct interest in the Benson and Tabbot patent application itself, or in the enforcement of any patent issued thereon.[4] However, the subject matter of that patent claim—computer programs—is of vital concern to the data processing industry. As *amicus curiae* herein BEMA has a deep interest in the proper resolution of the legal questions raised in this case and the profound impact this decision will have upon the data processing industry and the public it serves.

In this brief, BEMA will attempt to outline the inevitable difficulties and uncertainties in the future development and use of computer programs which will follow if the lower court's decision is affirmed, as well as the social, economic and practical implications of any holding that computer programs are patentable subject matter. When the issue presented in this case is considered fully, it is apparent that the lower court's decision misconstrues the constitutional and statutory

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[4] It is conceivable that, if this patent is issued, Bell Telephone Laboratories will allege that some or all of the BEMA members require a license. However, the submission of this brief was motivated by concern relative to the overall issue of whether programs are patentable rather than by any concern about the specific patent involved.

mandates concerning patentable subject matter and that its affirmance could inhibit future developments in this field which affects virtually all aspects of our society.

## II.

## THE NATURE OF COMPUTER PROGRAMS

Although the subject of electronic data processing is complex by its very nature, it is nonetheless possible to discuss computers and computer programs in relatively simple terms. A computer is essentially a machine which in acting upon information (i.e., instructions and data), performs a finite or determinable number of distinct operations on that information (data) and produces an answer or result. In effect, the computer enhances and extends man's problem solving capacity by providing more powerful methods for calculating, storing, organizing, structuring, retrieving and manipulating large amounts of information in the form of data.

The makeup of a general purpose computer may be described in the following manner. The machine has input and output units which accept and deliver formatted information; a memory or storage unit which holds or keeps data in addressable locations; a calculating or computing unit which performs various arithmetic and logical operations upon the data; and a control unit which controls the operations and coordinates the activities of the other units. The data or instructions are manifested in these various units by electrical pulses or states. Each of these units has various devices for manipulating or handling the electronic pulses and basically all function in accordance with the so-called binary mode (*i.e.*, each element can have its state elec-

trically altered from 0 to 1, from positive to negative or from more than to less than).[5]

The electronic digital computer was first used commercially in the mid 1950's.[6] The revolutionary nature of this instrument resulted from the ability to use electronics and electromagnetic impulses to simulate problems and to manipulate, handle and store data and and information needed to solve problems in ways never before considered feasible. In the intervening twenty years, the capabilities of computers have advanced remarkably, and it is now possible for one machine to service—virtually at the same time—many users with unrelated and diverse needs. The advance in the state of this art in the last two decades is evidenced by a comparison of the fundamental addition function of one of the most advanced electro-mechanical machines ever built: the Mark I, and present day computers. The Mark I could perform one twenty-three digit addition in three-tenths of a second, whereas present day machines can perform five million such additions in the same time period.[7]

Although a computer is capable of handling a large variety of problems, the number of basic operations it can perform (adding, subtracting, multiplying, dividing, comparing, shifting, storing and the like) is limited. Every computer can operate solely in accordance

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[5] For a general discussion of how a computer operates, *See*, Protecting Proprietary Rights of Computer Programs: The Need For New Legislative Protection, 21 The Catholic University Law Review 181, (Fall, 1971).

[6] The first commercial sale of a computer took place in 1954 when Univac I was sold to a private company.

[7] Computers, Office Machines and The New Information Technology (MacMillan, 1969).

with the directions it is given. These directions are contained in the computer program and tell the computer how it should manipulate and compare data in accordance with the algorithm or logical or mathematical formula upon which the program is based.[8]

It is important to emphasize that regardless of the complexity of a computer program it is nothing more than a set of instructions to a computer as to how it should manipulate information and data. The computer program may direct something as simple as adding two plus two, or as complex as determining the proper course for a manned flight to the moon (a series of arithmetic calculations). In solving such problems, the computer can only function in accordance with the algorithm used by the programmer for solving the problem.

Computer programs are often described as either systems or applications programs. Systems programs (executive routines) are normally developed by the computer manufacturer, and are designed as an integral part of the computer system functioning in a housekeeping or control capacity for the many specific types of jobs to be performed. Applications programs, in effect, make a general purpose computer system function as a special purpose system for a limited time and purpose, and a large number of these programs are developed by the various computer users. Frequently, there is disagreement as to whether a given

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[8] An algorithm is a logical series of steps which proceeds from a beginning point to some conclusion and takes account of all the logical possibilities that can occur between these points. The respondents in this case adopted a similar definition in their application to the Patent Office which stated: "By 'algorithm' is meant a self-consistent set of ordered steps specifying definable operations and leading to a desired result." (R. 34).

program is an applications or systems program; however, this brief refers in greater degree to applications programs.[9]

In whatever form it is ultimately utilized, a computer program is created in essentially the same way in which one writes a book or musical score. A senior programmer or systems analyst, who is frequently a highly skilled mathematician, will first set forth in broad terms the desired mathematical principles or logical sequences or methods to be used in solving the problem. In the computer field, this process is known as developing an algorithm. This algorithm is normally expressed by means of a so-called flow chart or decision table. The next step in the process is often handled by a second person, sometimes called a "coder", who need not be as highly skilled, and who develops a detailed set of instructions or code which will tell the computer how to implement the algorithm set forth on the flow chart. In devising the algorithm and in preparing the flow chart and code or set of instructions, the programmers need know little or nothing of the computer's workings or how it actually handles and manipulates the information received.

Given a particular algorithm, the programmer (i.e., coder) takes the limited number of fixed operations which a computer is capable of carrying out and arranges these operations in a sequence so that the desired algorithm is implemented. The result is what is termed a program. In other words, the program determines how the computer will implement the steps

[9] This brief is not directed toward computing systems expressed as configurations of hardware circuitry which if properly disclosed and claimed may constitute patentable subject matter.

or procedures incorporated in the algorithm being used to solve the given problem.[10]

An appropriate analogy is often considered to be found in the way in which a player piano operates. The piano has a mechanism for automatically operating its keys according to the instructions or code contained in a punched paper tape or paper piano roll. A given musical composition can be automatically played on the piano by simply punching holes in the piano roll in such a manner that the keys will play the musical notes called for by the composition. In fact, the piano and its control mechanism are designed in such a way that it is able to perform any musical composition whose notes are recorded in the tape or piano roll.

The algorithm or mathematical principle upon which a computer program is based is the equivalent of the musical composition in the player piano analogy, and the series of machine instructions used to implement the algorithm in a computer program, are analogous to the punched paper piano roll. In both instances, the second step amounts to nothing more than a set of instructions for the machine (*i.e.*, computer or piano) automatically to implement the mental processes or steps contained in the algorithm or musical composition. Such creativity as exists lies solely in the development of the algorithm or musical composition, and any patent issuing thereon would necessarily be grounded on the ideas or mental steps involved.

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[10] See, discussion of basic elements of computer programming in Breyer, The Uneasy Case for Copyright: A Study of Copyright in Books, Photocopies, and Computer Programs, 84 Harv. L. Rev. 281, 340-51 (1970).

## III.

## ARGUMENT

### A. POLICY CONSIDERATIONS OPPOSED TO THE AVAILABILITY OF PATENTS FOR COMPUTER PROGRAMS

#### (1) Continued Economic Growth In the Computer Industry And Full Utilization Of Computers May Be Substantially Impeded By Granting Patents On Computer Programs

In less than two decades the computer industry has become a major and substantial factor in our economy and now impacts virtually all segments of society. When computers were first used commercially less than twenty years ago, a number of respected businessmen, scientists and public officials believed that the ultimate need for such highly sophisticated devices would be limited to a few dozen systems. In fact, the uses and applications of computers have increased beyond the most extravagant earlier projections, and by 1972 over 165,000 computer systems made by American-based companies are reported to be in use, with a cumulative value of $49.8 billion.[11] This rapid growth will continue over the next few years and it has been estimated reliably that by 1976 there will be over 357,000 American-made computer systems in use with a value in excess of $87 billion.[12]

In the so-called programming and software side of the industry, computer users are already spending as much on software as they are on computer hardware,

[11] EDP Industry Report, March 30, 1972, Vol. 7, No. 10 at p. 4. These figures are for worldwide use of computers made by American companies. In the United States alone, the cumulative value of computer systems in use in 1972 is estimated at $30.3 billion and by 1976 this figure is projected at $50.4 billion.

[12] *Id.* at p. 4. This report also states on page 1 that in 1971 total worldwide revenues for American-based companies from computers and related activities was $12.5 billion and that by 1976 total revenue will be $27 billion.

and the software field has itself become a multi-billion dollar sub-industry.[13] The growth rate of the software field is expected to increase significantly and in less than five years computer users will be spending at least twice as much on software as on computer hardware.[14] For example, it has also been estimated reliably that the gross value of software purchased and supplied in the United States in 1970 was approximately $5 billion, that by 1975 this figure should double to $10 billion, and that by 1980, it will triple to $15 billion.[15]

The tremendous growth of the computer software industry and the vast number of breakthroughs in the field of programming, which have occurred in the last two decades, have taken place in a legal framework conducive to the free interchange of ideas and information. Industry experience shows that new algorithms and programming techniques, as well as specific programs, have been widely disseminated and generally exchanged. Users of computers have been able to draw freely from large libraries of programs and algorithms developed by other users, and computer manufacturers.

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[13] To select an arbitrary point in time to illustrate the growth factor, in 1957 the Association For Computing Machinery had approximately 3,000 members which represented the vast majority of the working computer programmers in the United States. Some fifteen years later in 1972, it has been estimated that the number of employed programmers exceeds 250,000, and by 1975 it has been conservatively estimated that there will be in excess of 500,000 working programmers. *See, Expanding Use of Computers, In The 70's, Markets • Needs • Technology*, p. 51 (Prentice Hall, 1971); Carlson Testifies on Programmer—Professional or Not, 14 Communications of the ACM 201 (March, 1971).

[14] "Towards the Computer Utility: Evolution or Revolution," *Datamation*, October, 1969, p. 125.

[15] *See, Expanding Use of Computers In The 70's, Markets • Needs • Technology*, pp. 54-55 (Prentice Hall, 1971).

This atmosphere of intellectual freedom has contributed significantly to the enormous strides made in the use of computers. The Department of Justice found during its examination of the computer programming field that:

> Growth in the software portion of the computer industry has been facilitated by a remarkably free and easy exchange of ideas, concepts, and programs. One of the notable features of the programming industry, indeed, has been the widespread establishment, sponsorship, and universal acceptance of joint user groups to facilitate the exchange of programs and algorithms. As a result, for the past twenty years, *almost all basic ideas in computer programming have been available openly to all computer users.* (Emphasis added).[16]

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[16] Letter dated October 21, 1966, from Donald F. Turner, Assistant Attorney General, Antitrust Division, to Edward J. Brenner, Commissioner of Patents. This letter further states that as a matter of public policy patents should not be granted:

> One of the major policy arguments advanced for extension of patent protection to computer programs is a supposed need to encourage individuals and companies to invest in programming development. But it is difficult to conceive how the field of programming could have grown faster, or that its past growth has been hampered in any meaningful fashion by a lack of investment funds. If anything, the current free interchange of programs has led to an extraordinarily efficient use of scarce programming talent and has kept needless duplication of existing programs and techniques to a minimum. Furthermore, many small software companies have achieved financial and technical success by producing more efficient versions of widely used manufacturer-developed programs. These more efficient versions of operating programs benefit other software producers, computer manufacturers, computer users, and the general public. In the light of past experience, any step which could upset the vital interchange of programming material should be approached with the utmost caution.

This atmosphere of freedom has benefitted not only the computer manufacturers, but also the users and the public at large. For years professional journals published algorithms and pertinent discoveries in mathematics in order to encourage overall advancement of the "state of the art" of programming. At various seminars and symposia on computer programming, open, frank and public discussions have been held concerning newly discovered algorithms or refinements of existing algorithms, and the participants have sought to build upon and improve the overall level of knowledge in the programming field. However, with the advent of patent protection for computer programs, as well as increased investment in software by users and software companies, more restrictive information handling practices are already in evidence, and certain professional journals have now taken the position that they will no longer publish allegedly novel algorithms if the person who develops them claims patent protection.[17]

Similarly, BEMA is informed that many computer users are reluctant to discuss new algorithms and are tending to shroud their computer programming operations in greater secrecy. This course of action is being followed in certain instances in order to protect a new algorithm or mathematical discovery pending the preparation and filing of a patent application, and in other instances, in order to avoid imagined or real infringement claims by holders of existing computer

[17] The Association of Computer Machinery ("ACM") has taken this position with respect to its monthly publication known as the *Communications of the ACM*. The membership of this association includes many professional computer programmers who rely upon and look to such professional journals for maintaining and improving their general knowledge concerning developments in the programming field.

program patents. In this regard, because most programs developed by these users are available to a limited number of employees and can be stored in machine readable form so as not to be perceptible to the human eye, it is difficult, if not impossible, to determine whether a given user is or is not infringing.

Another significant consideration is that the programming industry is quite different from other industries in which patent laws have wide application. One of its unique characteristics is that almost all of the end users of programs are also creators and duplicators of programs.[18] Although there are thousands of computer systems in this country, these systems service millions of users. Many of these user organizations have large staffs of programmers who spend full time preparing new algorithms or sets of instructions for programs, and these same users characteristically spend more internally for computer services than they pay externally for use of the computer.

Under the lower court's decision in this case, substantial practical impediments will now be imposed upon all users of computers. These users will be forced to assume a major responsibility for determining potential infringement claims arising out of computer applications programs they intend to use. They will be burdened with the need either to spend substantial time and money in right-to-use searches each time a different algorithm is to be programmed on an existing computer, or to employ secret methods of handling computer programming information in order to prevent others from ascertaining that they may have in-

[18] It is the user of a computer who often devises the application programs, i.e., the programs which adapt the computer and a general systems program to his specific uses.

fringed an existing patent. Adversely held patents based upon computer programs will be a constant threat to the unrestricted use of computers.

Unlike a copyright, a patent may be infringed without knowledge of the patent or intent to infringe. This means that each user of a computer would, if applications programs were patentable, proceed at his peril in employing the computer for his particular problem, never knowing whether the algorithms in his program were specifically covered by an existing patent or were the equivalent of a claim in a patented program. Such users could be confronted with the real possibility that use of a particular algorithm would involve them in nuisance infringement litigation unless they were to pay royalties claimed by holders of patents covering allegedly comparable programs. It is not a practical answer to say that each user could make a search to determine whether his proposed program infringed an existing patent. Many users of computers are relatively small entities, which do not have the capacity or finances to make such searches, even assuming "use" searches were feasible.[19]

Furthermore, since computers will be more widely used on a time-sharing basis in the future, the existence of patent monopolies on computer applications programs may seriously impede effective development and utilization of such multi-user systems. Often the proprietor of the computer in such systems does not know what programs the user is employing, and the user will frequently neither be fully acquainted with nor even

[19] There is not now—and there does not appear to be in the future—any feasible way in which such searches could be made. Nor can the burden be assumed by, or shifted to, suppliers of computers who do not have responsibility for, or often even knowledge of, the precise programs employed by users of their computers.

concerned with the details, structure or makeup of the computer. It will be substantially impossible for either of them to make an adequate right-to-use search and thus determine whether existing computer applications program patents might be infringed.

The patent claims in the instant case represent an excellent example of how the granting of a patent on a computer program could impede future development and use of computers and computer programs. For many computer operations, it is necessary to convert data from the binary coded decimal system to the true binary system, and purportedly, the respondents have discovered a new method for making this arithmetic conversion. This discovery was developed for Bell Telephone Laboratories, the assignee of the patent claim of the respondents (and their employer) for use in the telephone switching systems of American Telephone and Telegraph Co. ("AT&T").

It is widely known that AT&T's subsidiary, Bell Laboratories, has a large and highly sophisticated research and development activity and that Bell often claims arguably novel discoveries in computer programming.[20] Although these discoveries are made in connection with research for AT&T's telephone communications business, the concepts involved can have

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[20] In American Telephone and Telegraph Co.'s ("AT&T") 1971 Annual Report, at p. 14 it is stated that AT&T's expenditures for research and development in 1971 amounted to $480 million, most of it for Bell Laboratories' activities. In discussing Bell's research activities in the computer field, the annual report states: "Increasingly, the laboratories [sic] is applying its talents to the analysis of complex operating problems . . . and to the development of computer-based programs to facilitate economic management of telephone company resources."

broad application in the programming field.[21] Yet if Bell Laboratories is given a valid and enforceable patent on this discovery, all users of such computer programs, no matter what their field of application, could be liable for royalty payments to Bell for use of the algorithm involved. We submit that such a result was clearly never intended by Congress when it added the term "process" to the Patent Code in 1952, nor could it have been, without doing violence to the statute's Constitutional infrastructure," . . . to promote the progress of science and useful arts. . . ." Article I, Section 8, Clause 8.

**(2) The Future Potential Of Computers To Serve Society Will Be Adversely Impacted As A Consequence Of The Lower Court's Holding**

Increased computer utilization will contribute to a substantial upgrading of the quality of life for every American. In a few years, the computer will become the "engine" which assists in running our society[22] and will be able to assist man in numerous areas totally unrelated to the usual business applications for com-

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[21] The respondents acknowledged in their application that they claim a patent on the algorithm involved and not just its use in a telephone switching system:

> 'To avoid further difficulties, it is here expressly admitted that applicants' method claims are directed to a machine algorithm for converting binary-coded-decimal representations into binary representations. By 'algorithm' is meant a self-consistent set of ordered steps specifying definable operations and leading to a desired result. The program described symbolically on page 7 is just one way of implementing this algorithm.' (R. 34).

[22] Binger, "The Computer: Engine of the Eighties", *Advanced Management Journal*, January, 1967.

puters today.[23] Some typical examples of computer uses and applications which can occur in the next few years include the following:

*Health Care*

Computers will soon monitor instruments and sensors in intensive care units and give an instantaneous current diagnosis of the condition of each patient in a hospital. Computers will also record and analyze laboratory tests and will maintain accurate medical records on all patients. They will serve as communication and information links among various hospitals and individual doctor's offices and clinics, and will provide current information on all developments in the medical field. It is also predicted that as a result of the use of sophisticated computers in medical research, a cure for cancer may be found.[24]

*Education*

Computer-aided training and instruction will become commonplace, and for the first time high quality education will be available to all children on an equal basis, including those in ghettoes and remote rural areas. Computers will be heavily responsible for

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[23] Among the many articles discussing the revolutionary impact computers will have on our society are the following: Bjerrum, "Forecast of Computer Developments and Applications 1968-2000," *Futures*, June, 1969; Martino, "What Computers May Do Tomorrow," *The Futurist*, October, 1969; Hammer, "Electronic Systems of Today and Tomorrow," Paper for State Department Seminar, June, 1969; "What Comes Next in The Computer Age," *U.S. News & World Report*, June, 1967; Diebold, "The New World Coming," *Saturday Review*, July 23, 1966; Ware, "Future Computer Technology And Its Impact," The Rand Corporation, March, 1966.

[24] McCarn and Moriarty, "Computers In Medicine," *Hospitals, J.A.H.A.*, January 1, 1971; "The Computer In Medicine," *Am. News*, March 2, 1970; Reilly, "Computers In Medicine," *Datamation*, May, 1969.

making practical that everyone, regardless of economic status, have the advantages of higher learning. In addition, virtually all of the world's recorded knowledge can be tied together and retrieved, so as to be available for instantaneous use wherever a computer terminal is located.[35]

*Science*

Computers will make possible further advances in science, such as exploration of other solar systems and interplanetary travel. Scientists will be able to converse with computers and have available large libraries of data on an instantaneous basis. This will make possible a push back in the frontiers of mathematics, chemistry, physics and engineering to an extent difficult to comprehend by present standards.

*Government*

Computers will also present unique opportunities for government to be more effective and helpful to the average citizen. With the aid of new technological developments in computer programming, a given problem such as pollution control or urban planning, can be simulated in terms of a mathematical model. This model can then be entered into the computer and the data manipulated to stimulate actual results from the application of a proposed solution.

There are also tremendous potentials for computers to assist in relieving the nation's crowded court dockets, to collect and analyze legal documents and precedents, and to achieve better overall administration of the rapidly increasing workload of the police and law enforcement agencies.

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[35] *See,* Computers in Higher Education, Report of the President's Science Advisory Committee, February, 1967; Hansen, "Computers in Education," *The Clearing House,* December, 1970, Vol. 45, No. 4, p. 195.

In the case of judges and lawyers, computers will soon be able to furnish virtually instantaneous print-outs and summaries of all relevant cases and other precedents, and will also furnish invaluable assistance in collecting, summarizing and cataloging much of the factual data involved in complex litigation and other areas of the law.

*Individual*

It is reasonable to expect that computers will present unique opportunities for the average individual in his everyday activities. Computer-directed systems can now control entire production operations and even whole refineries, chemical plants, steel mills or other continuous manufacturing processes. Man is thereby freed from routine tasks and is able to apply himself to more productive and fulfilling work.

In the home, computers will assist in performing such functions as food procurement, climate and lighting control. Also, computers will make it possible for individuals to obtain information needed on any subject, through point-to-point communication with a central computer. In a few years computer terminals or communication devices will be just as common in homes as telephones or television sets.

To a substantial degree, whether the future potential of computers will be fully realized depends on the legal framework within which the industry is developed. If the lower court's decision is upheld, future growth in this field may well be impeded to the ultimate disadvantage of the public. As indicated hereafter, such a result was never intended under the Patent Clause of the Constitution, Article I, Section 8, Clause 8, nor the Patent Statute, Title 35 U.S.C.A.

**B. THE NATURE OF COMPUTER PROGRAMS AS MENTAL STEPS RENDER THEM INELIGIBLE FOR PATENT PROTECTION UNDER THE CONSTITUTION AND THE PATENT CODE**

The lower court in this case has held that a computer program may be a "patentable process" under the applicable sections of the Patent Code, Title 35, U.S.C.[36] This holding is clearly in conflict with the weight of judicial authority, as well as the considered view of the Patent Office and the President's Commission which conducted a detailed study of the patent system.[37]

As discussed previously in this brief, a computer program is essentially a plan of action or set of operating instructions for a computer, and encompasses an algorithm or mathematical formula which is an abstract idea or principle. The significance of the instant case is that it makes possible the patenting of a claim covering a method or algorithm for solving problems, regardless of the nature of the apparatus used for implementation. In the lower court's view, the method utilized to implement the claim is irrelevant and, in fact, the court observed that the claim involved here could theoretically be implemented by any kind of recording medium, including "pencil and paper" or even "red and blue poker chips and a surface to put them on or slots to put them in so that 0's and 1's can be represented."[38] The effect, therefore, of the instant decision is to provide patent protection to abstract

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[36] The lower court's decision is reported at 441 F.2d 682. The relevant statutory provisions are contained in Sections 100(b), 101 and 102 of the Patent Code, Title 35, U.S.C.

[37] *See*, "To Promote The Progress Of Useful Arts," The 1966 Report of the President's Commission on the Patent System (reprinted in S. Doc. No. 5, 90th Cong., 1st Sess., p. 21).

[38] *See*, 441 F.2d at 688.

ideas and principles. Such a result is inconsistent with the prior holdings of this Court.

The relevant clause in the Constitution which governs the granting of patents is contained in Article I, Section 8, Clause 8 which provides:

> The Congress shall have power . . . to promote the progress of science and useful arts, by securing for limited times to authors and inventors the exclusive right to their respective writings and discoveries.

The focus of the patent clause (and the statutes implementing that clause) is on "progress," and Congress is granted only a "qualified authority . . . limited to the promotion of advances in [science and] the useful arts." *Graham* v. *John Deere Co.*, 383 U.S. 1, 5 (1966). Because "[t]he patent system must promote . . . progress," *Graham, supra*, "[p]atents cannot be sustained when . . . their effect is to subtract from former resources freely available to skilled artisans," *Great A & P Tea Co.* v. *Supermarket Equipment Corp.* 340 U.S. 147, 152 (1950).[*]

Among such resources are the scientific principles, mental processes and abstract intellectual concepts which are the basic instruments of scientific and tech-

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[*] As this Court declared in *Precision Instrument Mfg. Co.* v. *Automotive Maintenance Mach. Co.*, 324 U.S. 806, 816 (1945):

> A patent by its very nature is affected with a public interest. As recognized by the Constitution, it is a special privilege designed to serve the public purpose of promoting the 'Progress of Science and useful Arts.' At the same time, a patent is an exception to the general rule against monopolies and to the right to access to a free and open market. The far reaching social and economic consequences of a patent, therefore, give the public a paramount interest in seeing that patent monopolies . . . are kept within their legitimate scope.

nological development. The free interchange of such information cannot be restricted by patent monopolies. As Chief Judge Garret observed in *In re Abrams*, 188 F.2d 165, 168 (C.C.P.A., 1951):

> Citation of authority in support of the principle that claims to mental concepts which constitute the very substance of an alleged invention are not patentable is unnecessary. It is self-evident that thought is not patentable.

Also, see the passages from the letters of Thomas Jefferson, the first administrator of our patent system, quoted in *Graham* v. *John Deere Co.*, *supra*, at p. 8, n. 2.

As early as 1877, this Court perceived the serious problem of extending patent monopolies to ideas and in the landmark decision of *Cochrane* v. *Deener*, 94 U.S. 780 (1876) observed that basic scientific thoughts and abstract ideas cannot be patentable as a "process." That case set forth what has been considered for the last ninety-five years as the definition of a patentable process:

> . . . A process is a mode of treatment of certain materials to produce a given result. It is an act, or a series of acts, performed upon the subject-matter to be transformed and reduced to a different state or thing. If new and useful, it is just as patentable as is a piece of machinery. In the language of the patent law, it is an art. The machinery pointed out as suitable to perform the process may or may not be new or patentable; whilst the process itself may be altogether new, and produce an entirely new result. The process requires that certain things should be done with certain substances, and in a certain order; but the tools to be used in doing this may be of secondary consequence. (94 U.S. at 788)

This often quoted principle has become settled law. See *e.g.*, *Corning* v. *Burden*, 56 U.S. 252 (1853); *O'Reilly* v. *Morse*, 56 U.S. 62 (1853); *New Process Fermentation Co.* v. *Maus*, 122 U.S. 413 (1887); *Expanded Metal Co.* v. *Bradford*, 214 U.S. 366 (1909); *DeForest Radio Co.* v. *General Electric Co.*, 283 U.S. 664 (1931); *Mackay Radio and Telegraph Co.* v. *R.C.A.*, 306 U.S. 86 (1939); and *Funk Brothers Seed Co.* v. *Kalo Inoculant Co.*, 333 U.S. 127 (1948).

The logical application of the above-quoted principle announced in *Cochrane* to prohibit the patenting of "mental steps" and "mathematical formula or principles" was specifically recognized by the Court of Customs and Patent Appeals in *In re Yuan*, 188 F.2d 377 (1951) where Chief Judge Garret observed that "[t]his court has deemed it to have been thoroughly established . . . that purely mental steps do not form a process which falls within the scope of patentability as defined by statute." (188 F.2d at 380). *Also, see Halliburton Oil Well Cementing Co.* v. *Walker*, 329 U.S. 1 (1946) and *In re Venner*, 262 F.2d 91 (C.C.P.A., 1958).

The fact that computer programs are not suited to patent protection was also recognized by the President's Commission to study the patent laws. In recommending that computer programs not be viewed as a patentable article or "process," the Commission stated:

> The Patent Office now cannot examine applications for programs because of the lack of a classification technique and the requisite search files. Even if these were available, reliable searches would not be feasible or economic because of the tremendous volume of prior art being generated. Without this search, the patenting of programs

would be tantamount to mere registration and the presumption of validity would be all but non-existent.

It is noted that the creation of programs has undergone substantial and satisfactory growth in the absence of patent protection and that copyright protection for programs is presently available."[36]

Similarily, because of the nature of computer programs and the practical problems in conducting meaningful right-to-use searches in order to determine the present state of the art (*i.e.*, whether the claim is in fact novel and unobvious) the Patent Office promulgated guidelines in 1968 which stated that "computer programming per se, whether defined in the form of a process or apparatus shall not be patentable." *See,* Patent Office, Guidelines to Examination of Application For Patents on Computer Programs, 22 Fed. Reg. 15609 (1968). These guidelines were suspended only after the lower court issued a series of decisions, culminating in the present case, which in effect have held that computer programs are patentable as a "process" under the patent laws. *See, In re Prater,* 415 F.2d 1378 (C.C.P.A. 1968), mod. on reh. 415 F.2d 1393 (C.C.P.A. 1969); *In re Bernhart,* 417 F.2d 1395 (C.C.P.A. 1969); *In re Musgrave,* 431 F.2d 882 (C.C.P.A. 1970); *In re Mahoney,* 421 F.2d 742 (C.C.P.A. 1970); *In re Foster,* 438 F.2d 1011 (C.C.P.A. 1971); *In re McIlroy,* 442 F.2d 1397 (C.C.P.A. 1971).

Consistent with the principles set forth in the *Cochrane, Abrams* and *Yuan* decisions, *supra,* the patent

[36] "To Promote The Progress of . . . Useful Arts," Report of the President's Commission on the Patent System, Washington, D.C. 1966, U.S. Government Printing Office, at p. 13.

examiner in this case held that the claim should be denied inasmuch as it was based upon a method or algorithm, which amounted to granting a patent on an abstract principle or concept of mathematics. Although the abstract principle set forth in the algorithm is implemented through a digital computer, this fact does not alter the essential characteristic of the algorithm as a mental process. Just as the use of paper and pencil to solve a mathematical problem does not change the abstract nature of the mathematical principles involved, so also the use of a computer—the tool of the modern day mathematician—does not alter the essential mental or abstract nature of the algorithm or logical method which forms the essence of the program. As the examiner who initially reviewed the claim observed:

> The method claimed is merely a program which is a set of instructions to control the operation of a computer. The instructions are not a statutory process such as a method of manufacturing an article, but a logical list of mental steps which can be applied to a computer to allow it to imitate the mental steps (R. 18).

Similarly, as the Patent Office Board of Appeals in its opinion stated:

> The fact that a mathematician may, as an aid to his memory, routinely elect to record on a suitable medium the symbols incident to his following the procedure specified by an algorithm, such as pencil and paper or other conventional computational apparatus, does not change the basic character of the process from its being an intangible, abstract line of reasoning (R. 139).
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> * * *
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> Thus it is to be seen that denying to the mathematician, as the appealed claims would do, access

to the usual tools of his profession, such as pencil and paper or a programmable computer, is to deny him an opportunity to understand appellants' mathematical algorithm. Such denial is a restriction on mental process and is tantamount to granting a patent thereon. It is not seen how such restriction on mental processes could promote science or the useful arts (R. 140).

It is, thus, apparent that the claims involved in this case essentially deal with a method of applying mental concepts and not of manipulating physical things.[21] The mere fact that a computer is used as a tool for implementing the algorithm does not convert the mathematical formula or logical principles upon which it is based into a "patentable process," and the lower court's decision has misconstrued the applicable statutory provision in extending patent protection to computer programs.

C. BECAUSE MANY COUNTRIES DO NOT GRANT PATENTS ON COMPUTER PROGRAMS, SERIOUS INTERNATIONAL COMPLICATIONS WILL OCCUR UNLESS THE LOWER COURT'S DECISION IS REVERSED

The owner of a valid United States patent is protected against whoever without authority "makes, uses or sells any [such] patented invention, within the United States during the patent period . . ." 35 U.S.C. § 271(a). It follows, therefore, that the courts will protect the owner of a domestic patent against any infringement within the United States, but that pro-

[21] Normally, fact findings by the administrative tribunal are conclusive on the CCPA, unless demonstrated to be clearly erroneous. *In re Kunzmann*, 326 F.2d 424 (CCPA 1964); *Application of Wietzel et al.*, 39 F.2d 669 (CCPA 1930); *Zenith Radio Corp.* v. *Ladd*, 310 F.2d 859, 862 (D.C. Cir. 1962); and *Lyman* v. *Ladd*, 347 F.2d 482 (D.C. Cir. 1965). Thus, the findings of the Examiner and the Patent Office Board of Appeals quoted above are conclusive as to the nature of the claims in this case.

tection is limited to the territorial limits and jurisdiction of the United States. This basic principle was recognized by this Court in *Dowagiac Manufacturing Company* v. *Minnesota Moline Plow Company*, 235 U.S. 641, 650 (1915):

> . . . The right conferred by a patent under our law is confined to the United States and its territories . . . and infringement of this right cannot be predicated of acts wholly done in a foreign country.

*Also, see, Laitram Corporation* v. *Deepsouth Packing Co.*, . . . U.S. . . ., 40 LW 4575 (No. 71-315, Decided May 30, 1972); *Amtorg Trading Corporation*, 75 F.2d 826 (C.C.P.A. 1935), *cert. den.* 296 U.S. 576 (1935); and cases cited in Deller, Walker on Patents, Section 216, pp. 36-37 (2nd Ed. 1965).

Because many foreign countries do not recognize computer programs as patentable subject matter, a unique problem can be presented if patent protection is broadly extended to such programs under the laws of the United States. With recent technological advances, it is now possible to have instantaneous communication via satellite or transoceanic cable between a computer input device in one country and a central computer in another country. Examples of this type of arrangement are frequently found in the area of national defense and in international business transactions, *e.g.*, computerized plane and hotel reservation systems. In such instances, someone in a foreign country could easily use or copy a program on which a patent has been issued in this country and have total immunity from any infringement claims under our law.

At present, many countries in Western Europe have extensive computer installations and frequently com-

municate via satellite or transatlantic telephone lines with computers located in the United States. Yet many of these countries have laws which prohibit the granting of patents on computer programs. For example, in France a statute was recently enacted which specifically prohibits patent protection for computer programs.[33] Similarly, in the Netherlands[34] and Switzerland[35] there have been recent court decisions declaring computer programs to be ineligible for patents. The United Kingdom government has appointed a committee to examine the patent system, and last year that committee substantially recommended that patent protection not be available for computer programs.[36]

Since several countries in Western Europe have decided not to extend patent protection to computer software, a serious international legal and balance of trade problem can result if the lower court's decision in this case is affirmed. It would be quite feasible for an organization to move all its programming operations (including its programmers and mathematicians) to such countries as France, Switzerland, the Netherlands

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[33] Article 7 of the French Patent Law of January 2, 1968. An English translation appears in Industrial Property 67-75 (BIRPI, Geneva, Switz., March, 1968).

[34] A recent decision of the Patent Office Board of Appeals, on December 16, 1970, held that computer programs are not patentable under the Netherlands Patent Act. BIE No. 2, February 15, 1971.

[35] Computer programming inventions are currently considered unpatentable in Switzerland as the result of a Swiss Patent Office decision of September 3, 1968. Patent Master Und Markenblatt 68-1-53.

[36] The British Patent System, Report of the Committee to Examine the Patent System and Patent Law, Cmnd. No. 4407, at 144 (July, 1970).

and the United Kingdom, and then copy or use programs on which patents had been issued in this country. Because of the availability of instantaneous communication between Western Europe and the United States, it would then be possible to use the patented program in Europe and communicate the result directly to a computer located in the United States. Under these circumstances, the domestic patent would be rendered virtually meaningless, and the chief effect would be on our domestic economy. Among other things, such a result would constitute an unfortunate and avoidable violation of United States employment and trade policy.

### D. ADDITIONAL PROPRIETARY RIGHTS IN COMPUTER PROGRAMS SHOULD BE OBTAINED THROUGH LEGISLATION AND NOT THROUGH A DISTORTION OF THE PATENT LAWS

BEMA recognizes that some form of proprietary rights in computer programs is appropriate to prevent unauthorized copying and use. In certain limited instances the amount of time, energy and money devoted to the development of certain types of programs should entitle the developer to protection. Copyright registration has been available for several years and, in addition, individual BEMA members have recommended that Congress enact laws granting a specific and tailor-made proprietary right for computer programs. Accordingly, if proprietary protection under federal statute, other than copyright, is considered necessary for computer programs, this result should be accomplished through legislation and not through a distortion of the patent laws.

In 1964, the Copyright Office determined that computer programs can be registered under the copyright

laws if certain requirements are met.[36] Since that announcement, several hundred such programs have been registered with the Copyright Office and by this means the author can prevent their copying in the form expressed. Of course, the existence of copyright protection does not prevent someone from individually arriving at the same result through his own efforts, and a copyright can only protect the form of expression used in a particular program.[37]

Those who are of the opinion that some protection in addition to copyright protection is needed recognize that because of the unique nature of computer programs a specific tailor-made system of proprietary rights is appropriate. Precedent for such an approach can be found in other areas where Congress has enacted special statutory provisions to cover a unique or special technology. For example, in the case of asexually produced plants, special provisions in the patent law have been enacted to protect new developments in this field.[38] Similarly, Congress has enacted special provisions in

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[36] *See*, U.S. Copyright Office Announcement SML-47 (May 19, 1964). Three conditions which software must meet for copyright protection are: (1) original authorship; (2) publication of copies in a form perceptible or capable of being perceptible to the human eye; (3) depositing copies for registration to consist of or include reproductions in a language intelligible to human beings.

[37] "The Uneasy Case For Copyright: A Study of Copyright In Books, Photocopies and Computer Programs," 84 Harv. L. Rev. 344, n. 247 (1970); "Copyright Protection for Computer Programs," 64 Colum. L. Rev. 1274 (1964); "Scope of Protection For Computer Programs Under the Copyright Act," 14 DePaul L. Rev. 360 (1964); "Computers, The Copyright Law and Its Revision," 20 U. Fla. L. Rev. 386 (1968); Cary, "Copyright Registration and Computer Programs," 11 Bull. Copyright Soc'y 361 (1964).

[38] 35 U.S.C.A. § § 161-164.

the copyright law with respect to phonograph records and tapes.[39]

At present, there are several bar association committees and various industry groups which are studying this problem,[40] and several legislative proposals have been under active consideration by the Congress since the report of the President's Committee on the patent system was issued in 1966. These proposals would create a special form of legal right specifically for the computer programming field,[41] and the existing patent law should not, and need not, be distorted in order to accomplish this result.

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[39] 17 U.S.C.A. § 1(f), as amended October 15, 1971, Pub. L. 92-140, § 1(a), 85 Stat. 391.

[40] Among the committees studying this problem are: Patent, Trademark & Copyright Section of the American Bar Association, Committee 408; Committee on Information Retrieval, American Patent Law Association; and Coordinating Committee of the National Council of Patent Law Associations established at the behest of the Commissioner of Patents.

[41] *See,* Galbi: "Software and Patents: A Status Report," 14 *Communications of the ACM* 274 (April, 1971); "Computer Program Protection: The Need To Legislate A Solution," 54 Cornell L. Rev. 586 (1969); Law of Software Conference, Computers-in-Law Institute, National Law Center, 1969 Proceedings, George Washington University.

## IV.

## CONCLUSION

For the foregoing reasons we respectfully submit that computer programs should not be eligible for patent protection and that the lower court's decision should be reversed.

Respectfully submitted,

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